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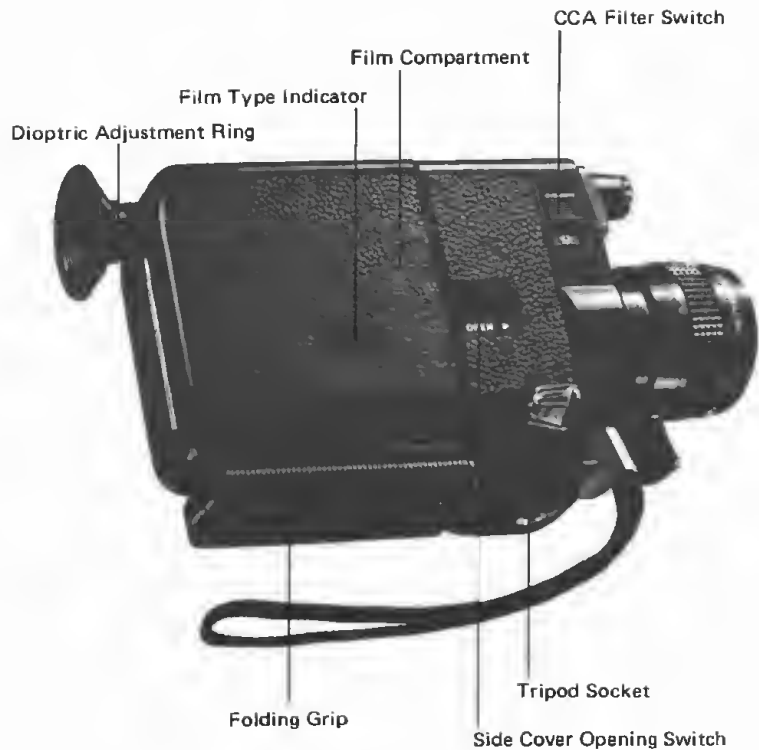
Canon 310XL



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INSTRUCTIONS





Canon 310XL Features

The Canon 310XL is a photography system that enables the shooting of dark subjects and indoor shooting, without any additional light, because of its fast lens and wide-angle shutter, and because of the high speed film which is used with it. It is a slim and compact camera with specifications that will satisfy not only the beginning photographer, but, as a second camera, expert photographers as well.

The Fastest (f/1.0) 3X Zoom Lens in the World

With the fastest lens of any 8mm movie camera, the Canon 310XL can clearly catch even very dimly lit subjects. Despite the speed of f/1.0, its newly designed lens construction of 13 elements in 11 groups obtains sharp picture images without flare at full aperture and excellent color balance. In addition, the Canon 310XL is most suitable for home movies with a considerable depth of field and wide angle within its focal length of 8.5mm—25.5mm.

Easy Close-up Photography using the Macro-photography Mechanism

The macrophotography mechanism enables one to shoot close-up photography without attaching any accessories. It can focus at a point 215mm from the film plane indicator by a simple adjustment of the macro set lever. The

field size is then 84.4 x 118mm.

Bright Viewfinder with Filming Information

The viewfinder has a large exit pupil to precisely catch dark subjects. Furthermore, the battery check, macro-indication, underexposure warning mark and film transport indicator are all contained in the viewfinder.

Easy-to-Carry, Slim, Compact Design

Even though the Canon 310XL is a camera with a large aperture f/1.0 lens, it has an extremely compact design. The diameter of the filter is only 43mm and the camera body is but 39mm wide.

High Performance Exposure Meter with IC

The exposure is accurately metered because there is a built-in high performance exposure meter with an IC within the metering circuit which is designed also to control the change in voltage. As for the power source, 2 penlight 1.5V batteries are used to power the film transport, auto zoom and exposure metering functions.

Other Characteristics

Exposure control plate for shooting against the light. A safety switch prevents accidental shooting. One set of batteries conveniently powers all the electric functions. Viewfinder Information.

Technical Data

Type: SLR type Super 8 with XL mechanism

Size of Picture Frame: 5.8x4.2mm, 5.4x4mm (Projection frame)

Lens: Focal Length 8.5 — 25.5mm (Zoom Ratio 3) f/1.0. Lens construction: 13 elements in 11 groups. Coating: Spectra Coating. Filter thread size: 43mm. Lens cap size: 45mm.

Macro Shooting Mechanism: Macro shooting mechanism is done by switching macro set lever. With the focus set at infinity (∞); close-up shooting at 215mm from the film plane indicator is possible. The field size is then 84.4 x 118mm.

Viewfinder: Single reflex aerial image system

(Viewfinder Information): Underexposure warning mark; Film transport indicator; Battery check lamp; Macro indication; Dioptic adjustment from -4 to +2 dpt. with eyecup.

AE Mechanism: Automatic exposure mechanism coupled to film speed and filming speed. Light measurement by a CdS photocell through the window above the main lens. Exposure Control Plate is built-in.

AE Metering Range: ASA 250 f/1.0 18fps; ASA 25 f/45 18fps, single frame

Film Speed: (Artificial light) ASA 40 160 250
(Daylight) ASA 25 100 160

Film Speed Setting: Automatically set when cartridge is loaded.

Color Temperature Adjustment CCA Filter: Built-in CCA filter for correct color balance with tungsten film under daylight and switch on camera body for quick cancellation of filter under artificial light. Filter is automatically cancelled when daylight type film cartridge is inserted.

Filming Speeds: 18 fps, single frame

Angle of Shutter Opening: 220°

Drive System: Film drive with high-performance electric micromotor and power zooming.

Power Source: 2 penlight batteries (3V).

Film drive; power zooming; measuring exposure; Sufficient for 5 cartridges under normal temperatures; One cartridge with new batteries when shooting single frames.

Footage Counter: Automatically returns to S and counts footage of exposed film. Coupled to the removal of the cartridge.

Battery Check: A lamp in the viewfinder activated by the check button.

Grip: Collapsible

Socket: Cable releases socket

Switch: "ON-OFF" single frame switch used also as safety switch.

Safety Mechanism: Switch to prevent unnecessary battery consumption or shooting inadvertently.

Dimensions and Weight: 176 x 112 x 39mm; (6-15/16" x 4-7/16" x 1-1/2"); 580g (1 lb. 4 ozs. (including batteries))

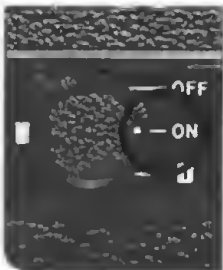
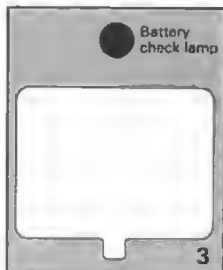
Subject to change without notice.

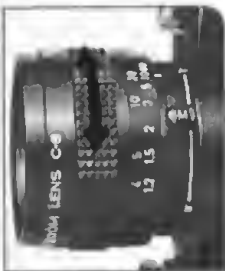
How to Film with the Canon 310XL

- 1 Remove cap and unfold the grip.
- 2 Load the batteries.
- 3 Check the batteries. (When main switch is at "ON").
- 4 Perform dioptic adjustment by adjusting the viewfinder.
- 5 Turn main switch to "ON".
- 6 Insert the film.

Note:

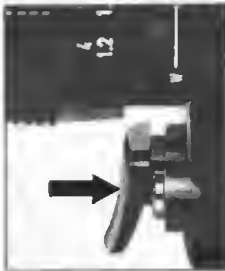
When filming out-of-doors in daylight, you should usually use the low speed film ASA 40. If you are filming out-of-doors in daylight with high speed film ASA 160, please use the Canon Filter ND-4.





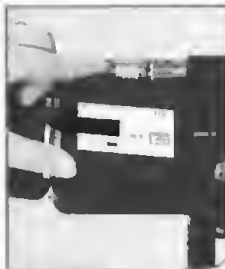
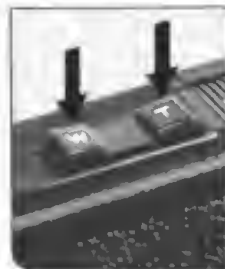
7 Check CCA filter.

8 Focus.



9 Check exposure.

10 Decide composition and pull shutter release lever. (Verify that the film can advance)



11 Zoom as desired.

12 Remove the film when you finish shooting.

Instructions for Shooting

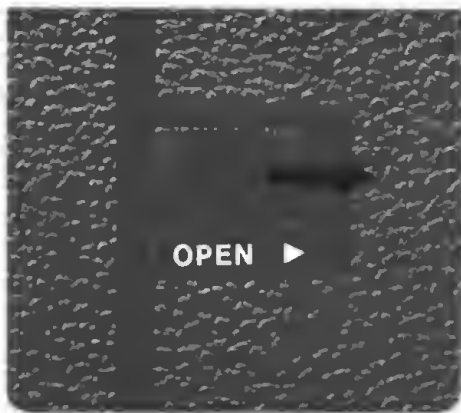
Unfold the Grip

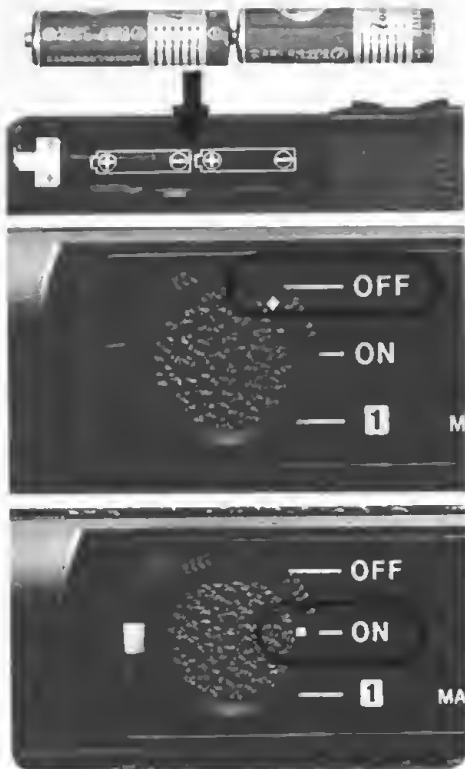
Pull out the grip in the direction indicated by the arrow. To fold it back, push it in the opposite direction.



Opening and Closing the Film Compartment

- 1 To open the film compartment slide the safety lock release in the direction of the arrow.
- 2 To close, simply push the cover in and it will snap in place.





Loading the Batteries

(The same batteries power the exposure meter, zooming system and film drive).

Insert 2 penlight batteries (size AA) of the same brand into the battery compartment. Be sure that the + and - ends of each battery are in the proper direction.

- * If the camera will not be used for a prolonged period, remove the batteries and store them in a dry place. (Batteries may leak and damage the camera if left inserted for a long period of time.)

Main Switch

By turning the dial of the Main Switch to "ON", all electric circuits are connected. Similarly, at "OFF" all the circuits are disconnected, and, as a safety measure, neither the shutter nor the zooming switch can be operated.

- * When the camera is not in use for a long period of time turn the dial to "OFF", in order to conserve battery energy. A red mark is visible when the dial is in the "ON" position to let you see at a glance that the power is "ON".

Battery Check

If the capacity of the batteries is insufficient, filming cannot be accomplished correctly. Therefore please remember to check the batteries occasionally.

1 Turn the main switch to "ON".

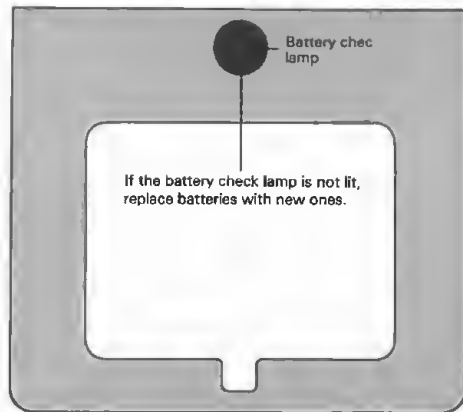
2 While looking through the viewfinder, push the battery check button.

If the lamp in the upper portion of the viewfinder is lit, voltage is sufficient for filming. When the lamp is not lit, replace batteries with new ones.

Replacing Batteries

Always use batteries of the same brand. One set of batteries is enough for five cartridges of film under normal conditions.

* While shooting single frames, if the capacity of the batteries is insufficient, first turn the main switch to "OFF", then replace the batteries.

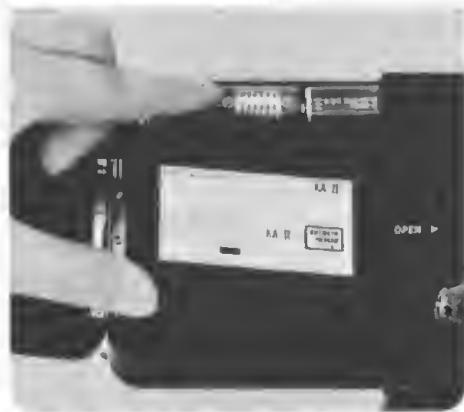




Dioptric Adjustment

While looking through the viewfinder, turn the eyecup to adjust the eyepiece to your vision.

- 1 Turn the focusing distance ring to infinity.
- 2 Look through the viewfinder. Turn the dioptric adjustment ring until the subject in far distance appears clearest and sharpest. The eyepiece adjustment range is from -4 to $+2$ diopters.



Loading the Film

Insert the film cartridge with the identification label placed as shown in the picture.

CCA Filter


The Super 8 camera is made to use tungsten type (artificial light) film under all conditions.

Therefore there is a CCA filter built into the optical path of the lens for adjustment of color temperature. When shooting in daylight, the filter should be applied, on the other hand, when shooting indoors with artificial light, the filter should be removed from the optical path.

However, when Type G film (for daylight or artificial light) or daylight type film is loaded into this camera, the filter is automatically cancelled no matter what the position of the filter switch is.

Settings of the CCA Filter

When you are using tungsten type film, the CCA filter has to be set differently according to the kind of light source.





Under artificial light, slide down the filter setting switch and when the  mark is visible, the filter is cancelled. In daylight, slide up the switch until

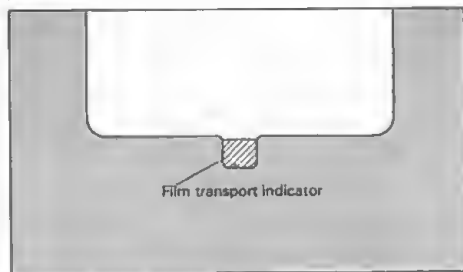
 mark is indicated. It is impossible to obtain

12 the proper color balance unless this is done.



CCA Filter Settings

Film Type	Light Source	
	Daylight	Artificial Light
Tungsten Type		
Daylight Type or G Type	 } Both positions  } can be used.	



Checking the Film Transport

The film transport indicator can be seen in the lower part of the viewfinder. The indicator is visible and moves up and down when the film is being properly transported. If the indicator does not move, remove the film cartridge and advance the film slightly with your finger; then insert the cartridge once more.

* When the film reaches the end, the film transport indicator stops.

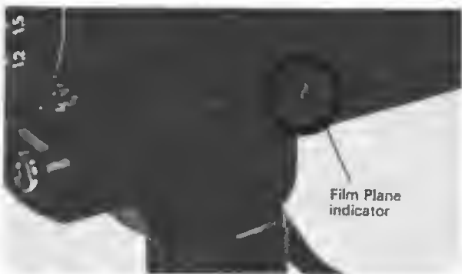
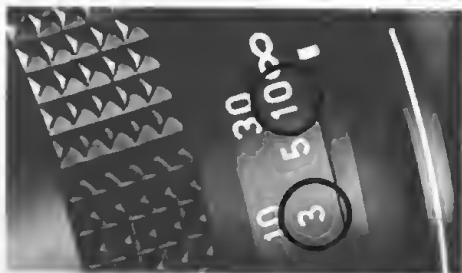
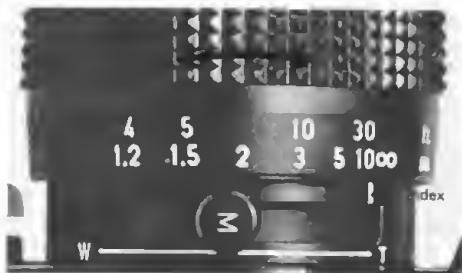
Setting the Distance

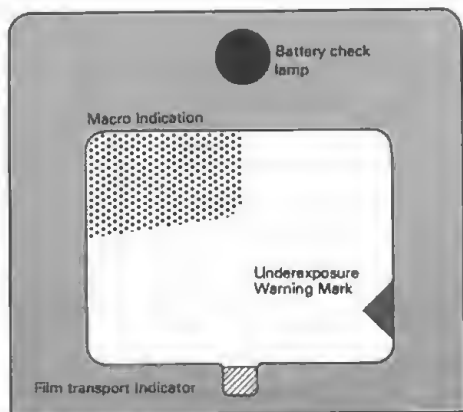
The Canon 310XL can focus as close as 1.2 meters, but distance must be estimated. After determining the distance between camera and subject, turn the distance ring until the proper distance is aligned with the index in order to focus correctly. The distance ring may be set at or in between the numbers. The row of white numbers represents distance in meters and the row of green numbers represents distance in feet.

Using the Zone Focusing

When filming out-of-doors under a clear sky, the depth of the field is increased and you can simply use the 3 or 10 red zone gradations without focusing exactly. (For generally close shooting of up to about 7 meters set the distance ring at 3; for shooting subjects farther away set the distance ring at 10).

When perfect focusing is required, measure the distance between subject and camera exactly and adjust the distance ring accordingly.





Confirming the Exposure

When the subject is too dark, a red mark in the lower right part of the viewfinder warns of underexposure. Under these conditions, use additional light. A battery check lamp, film transport indicator, and macro indication are also built into the viewfinder.

Exposure Control Plate

For filming snowcovered mountains in the daylight, at the beach or when it is clear out, if a high speed film (ASA 160) is used, the picture will be overexposed. We would highly recommend the use of ASA 40 (25) film for daylight and outdoor photography. When you use the film of ASA 160, please use the Canon Filter ND-4. When attaching the filter to the lens, pull up the exposure control plate which is located at the base part of the light metering window. The adjustment of this exposure control plate is 2 stops.

- * Do not use an ND filter together with a UV or Skylight filter.
- * Do not use filters except of 1 or 4 of exposure factor.

Exposure Adjustment When Shooting Against the Light

The exposure control plate is used in order to attain the correct exposure when shooting against strong direct light such as when the sun is behind the subject. Exposure adjustment value is approximately 2 f/stops. When shooting a subject with a window in the background or in ordinary light conditions, exposure adjustment is not necessary.

Pull the shutter release lever and shoot

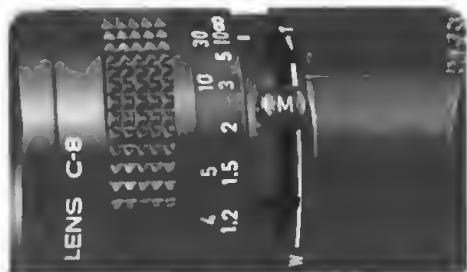
Press the zooming switch when necessary. Zooming can be used for composition or to make the image change continuously. Power zooming or manual zooming are both possible.

Power Zooming

- 1 While pulling the shutter release lever, press the zooming switch.
- 2 The subject will become larger when "T" is pressed, and smaller when "W" is pressed. When the image stops moving, the zooming lever will not rotate any more.

* Keep the light metering window uncovered while you operate the power zooming. Power zooming cannot be performed without pulling the shutter release lever.





Manual Zooming

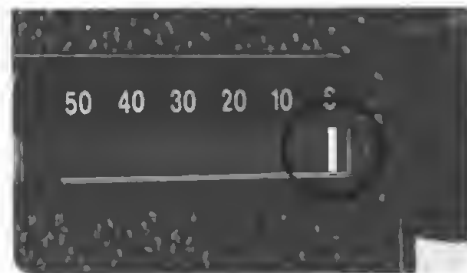
Since power zooming produces the zooming effect at a fixed speed, use manual zooming for zooming at different speeds.

- 1 Rotate the manual zooming lever (doubles as macro set lever) up or down as desired.



After Shooting, Remove the Film Cartridge

- 1 When the film ends, the film transport indicator in the viewfinder stops.



- 2 After you have shot 50ft., open the film compartment and remove the film cartridge. In this case, the film footage counter automatically indicates "S".

* When filming the television picture, the picture will be overexposed since the light is outside of the lens. When you shoot the picture, we would recommend placing a table lamp on the television to obtain correct exposure.

Macro Filming

The Canon 310XL has a built-in macro-filming system which enables titling or close-up shooting by simply moving the zooming lever. In macro-filming, focus at 215mm from the film plane indicator.

1 Rotate the macro set lever and set it at the "W" position.

2 Rotate this lever to the "W" position and then pull and slide it further to the "M" position to set for macrophotography. When shooting macrophotography, a yellow mark appears in the upper left of the viewfinder. (Refer to page 15)

3 Set the distance scale on the focusing ring at infinity.

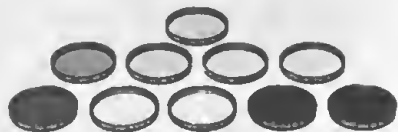
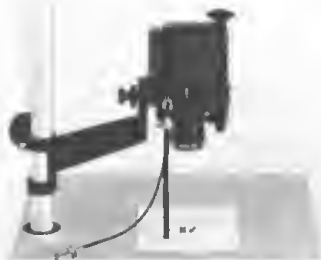
4 Measure 215mm from the subject to the film plane indicator. The wrist strap is approximately the correct length. Measure it once, and then use the wrist strap to measure the distance, between the subject and the film plane indicator, judging any remaining distance by eye.

5 To cancel the macrophotography mechanism, slide the lever back to the "W" position.

* With the distance ring at infinity, the full field size is 84.4 x 118mm.

* Macro shooting should be performed in a well-lit place.





Accessories

Copy Stand 4 and Copy Stand 5

Copy Stand 4 and 5 are convenient for macrophotography, title shooting and copy work.

Filters

Use 43mm filters for both color films and black and white films.

Type: UV, Skylight, CCA 4, CCA 8, CCA 12, CCB 4, CCB 8, CCB 12, ND4, ND8, ND4-L, ND8-L.

C-8 Wide Attachment Lens 43

This is an attachment lens for super wide-angle shooting. If only adjusting the macro setting lever to the macro position and attaching the lens on the camera, you can easily perform super wide-angle shooting with the fixed focal length of 5.5mm. When the exposure is more than $f/4$, the focal length is most suitable at 0.8 m to ∞ , so you can concentrate on photographing without worrying about focusing.

Maintenance of the Camera

The accumulation of tiny film fragments and dust particles at the film gate may stain the film. Clean the film gate occasionally by whisking off foreign materials with a soft brush or blower.

When storing the camera, take it out from the case and put it in a dust-free, dry place. Do not place the camera near camphor or naphthaline. It is better for the camera to be used occasionally than to store it away for a long time.

Have your camera checked at one of the Canon authorized service facilities at least once every three years. Also, when the camera is not in use, take out all the batteries inside.

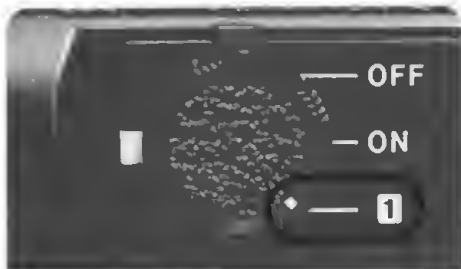
Never touch the lens surface with your fingers. Whisk any dust on the lens off with a blower or soft brush. If you get fingerprints on it inadvertently, wipe them off lightly with a silicone cloth.

If you drop the camera into the sea, it will probably not be reparable but nevertheless please consult your nearest Canon service facility.

After completion of your shooting and when placing your camera into the case, please make sure to turn the On-Off switch on your camera to the "Off" position.

It is extremely damaging for the camera to be left in high temperatures. The temperature in the rear window and trunk of a car can rise to over 60°C.

* For reference in case of theft, keep a record of the serial number of your camera.



Single Frame Shooting

Single frame shooting is possible for titling or animation with the automatic exposure mechanism and will enhance the enjoyment of making movies.

- 1 Turn the main switch to "1".
- 2 Each time the shutter release is pulled, only one single frame is exposed. In single frame shooting, the use of a tripod and cable release will assure a stable image.

Cable Release Socket

It is advisable to use the cable release whenever single frame shooting is performed or when using a tripod. The cable release socket is next to the shutter release lever.

Holding the Camera

To avoid blurred movies, it is most important to hold the camera correctly. The best method of holding the camera is to put your hand through the strap and grasp the grip while putting the other hand on the top of the camera, for focusing or zooming. When holding the camera, press your elbow firmly against your body and keep your feet slightly apart. When performing photography with your eye separated from the finder's eyepiece, cover the eyepiece with your hand so as to prevent outside light from entering the finder.



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